

17. Potter, J. E.: Syphilis—Treatment of Wassermann-Fast and Cerebrospinal Syphilis by Modern Methods, Calif. and West. Med., 35:97-101, 1931.

18. Epstein, Norman, N., and Paul, S. Barre: The Treatment of Syphilis with Hyperpyrexia Produced by Diathermy, Am. Jour. Syph., 17:72 (Jan.), 1933.

DISCUSSION

H. J. TEMPLETON, M. D. (3115 Webster Street, Oakland).—The advent of hyperpyrexia in the therapy of central nervous system syphilis has certainly brightened the prognosis. Whereas paresis was formerly almost a 100 per cent fatal disease, approximately one-third of the patients can look forward to complete arrest from fever therapy. Moreover, sufficient time has elapsed to permit us to state that many of these arrested cases remain well permanently. In 1930 it was my privilege to have seen two of the original series of paretics treated by Wagner-Jauregg with malaria in 1919. Twelve years later they were in apparently good health and self-supporting, although they could not be called extremely alert mentally.

Evidence is gradually accumulating which shows that it is the actual fever which produces improvement, and not any immune process following the malaria. This should lead us to continue investigations of other methods of producing transient controllable fever. Of the methods known today, diathermy and radiotherapy would seem to be the most practical.

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HELEN HOPKINS, M. D. (925 Pacific Mutual Building, Los Angeles).—Interest in thermotherapy, developed by the epoch-making observations of Wagner-Jauregg regarding the beneficial properties of malaria in neurosyphilis, has not only been unusual, but has proved to be of great practical value to mankind. It has been assumed that the heat generated within the body in this condition is chiefly responsible for the favorable results observed in so many patients. Other fever-producing measures subsequently utilized appear to have been effective in proportion to the height to which the body temperature could be raised, and also to the length of time maximum temperatures could be maintained without damage to the body.

Experimental investigation into the chemical and physiological changes developed within the human organism with subjection to hyperpyrexia baths broadens one's conception to include other therapeutic factors in addition to those of thermal nature. Well-defined states of alkalosis, anoxemia, water-shifting, and disturbances in ionic equilibrium make their appearance, resulting in alterations in surface tension, permeability of cells, and oxygen supply to the tissues. These conditions in conjunction with the thermal changes, in all probability function to create an environment which is noxious to invading parasitic organisms, inhibiting their growth and extension, and ultimately terminating in their complete destruction.

Doctor Beerman and his co-workers have presented valuable and instructive clinical material in this contribution. Their method for accomplishing and maintaining temperature elevation in human beings appears to be a safe, effective procedure.

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RICHARD W. HARVEY, M. D. (Four Fifty Sutter, San Francisco).—In 1932 a patient was referred by me to Mount Zion Hospital for treatment with hyperpyrexia by the method described in this paper. His family physician had found his serology positive, but because of mental symptoms developing had sent him to me. He was confused, showed loss of memory, and his dysarthria and tremors were typical of paresis. He was given seven treatments at intervals averaging four days. During six treatments there was a secondary temperature rise occurring two or three times following the initial temperature rise, with a fall in systolic and diastolic pressure of slight degree. During the last treatment the patient had a convulsion accompanied by a marked fall in pressure, and the treatments were discontinued. Five days later he was discharged from the hospital remarkably improved mentally. He was clearly oriented, the tremor was gone, and there

was no speech defect. Serologically he was not improved. He was sent home with advice to continue conservative treatment with the referring physician. Several months later a letter described him as holding his improvement and requesting permission to return to work. A spectacular result such as this one has occurred before the days of artificial fevers during intercurrent infections. This observation led to the study of hyperpyrexia as a method of treatment in paresis. As compared with the malaria method, diathermy seems to me to be preferred for ambulatory cases, and there is not the physical suffering experienced by patients in the malarial paroxysms. Furthermore, the method does not depend on the success of an inoculation procedure. While the treatment is a success in restoring the mental status of a patient in only a small percentage of cases, it should be continued, with our encouragement, by the investigators at Mount Zion Hospital.

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DOCTOR EPSTEIN (Closing).—Artificially produced hyperpyrexia has become an established method of treatment of neurosyphilis. Beneficial results are obtained by the use of fever which cannot be duplicated by chemotherapy. It is generally agreed that the elevation of body temperature is the essential factor in this type of treatment, rather than some specific action of the agent producing the hyperpyrexia.

This field of investigation is still in an experimental stage. It is very probable that diathermy or radiotherapy will be replaced by some more simple method of elevating the body temperature. We have been able to obtain very satisfactory fevers in patients by the use of a heat cabinet, which will be described in a later report.

THE LURE OF MEDICAL HISTORY*

FIFTY YEARS OF PROGRESS IN THE PREVENTION OF DISEASE†

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San Francisco

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PELLAGRA

THE history of the relation of pellagra to diet is fascinating. Pellagra was described by Casol in 1735 in northern Spain. It is common in Italy and some of our southern states, and not unknown on the Pacific Coast. It is a disease involving the nervous system, the digestive tract, and the skin, with its remarkable symmetrical erythema on special locations on the body. The variety of work performed in the study of this disease, and the many theories as to the causative factors, cannot be discussed here. Suffice it to say that Goldberger and his associates found that in institutions more cereals and vegetables were used than in the diets of other people who were immune. Those who were free of the disease ate more fresh meats, eggs, and milk. These investigators, to prove their point, carried on their work in a state prison and offered pardons to any healthy persons

* A Twenty-Five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellany Department of CALIFORNIA AND WESTERN MEDICINE, and its page number will be found on the front cover index.

† One of a series of public lectures by invited speakers, conducted by the Stanford University School of Medicine. From the Department of Public Health, San Francisco.

‡ Part I of this paper was printed in CALIFORNIA AND WESTERN MEDICINE, November, page 327; Part II, December, page 406; Part III, January, page 40; Part IV, February, page 110; Part V, in this issue, completes this paper.

who allowed themselves to be fed experimental diets. Eleven were chosen. The diet consisted of white wheat flour, degerminated cornmeal, polished rice, starch, sugar, molasses, pork fat, sweet potatoes, collards, turnip greens, and coffee. Six of the men developed pellagra. Goldberger, however, went further. He inoculated himself and fifteen associates with blood, nasosecretions, feces, urine, and desquamating epithelium, with negative results. It remained for Smith and Hendrick to find that yeast, after autoclaving under pressure to destroy the antineuritic factor, still contained an essential factor. The preventive diet factors for this disease are, therefore, yeast, lean meat, milk, and eggs, and perhaps the yellow pigment-carrying foods, such as butter and carrots.

DIETARY AND DEGENERATIVE DISEASES

Teachers, nurses, parents, and children need to be taught adequate nutrition, the need of rest and the difficulties that follow chronic fatigue. Physical defects that interfere with growth, or aid infection, should be removed or corrected. The steadily mounting death rate from heart disease, Bright's disease, and cancer, overshadowing as they do all other causes, makes it imperative that this challenge be met. It can best be done in the early years of life, and it behooves parents to set the examples of hygienic living for the imitative tendency of children to be put in action. To the degenerative diseases, looming so large, many predisposing factors are listed, of which at least four are related directly or indirectly to nutrition habits. McCollum asserts that, of the factors in our physical deterioration, the chief one may lie in the unwise choice of food. McComber, in his studies of the diets of sterile women, has suggested that the glandular dysfunction may have been preceded by unsatisfactory dietary habits. More recently, Langstroth, analyzing the histories of over five hundred patients, has this indictment of American dietary: it is low in vitamin and residue, high in calories, in carbohydrate, and in its ratio of acid to alkaline ash-forming foods. This writer remarks that certain primitive people are free of our chronic diseases, and an introduction of the white man's food has meant introduction of the white man's diseases.

Correction of diets may afford relief in degenerative disease, particularly because of reduction in the food consumption and burning up load, or metabolic load, with subsequent fall in blood pressure and, therefore, diminished work for the heart or cardiac load. Langstroth goes so far as to state that individuals have inherent differences as to vitality or resistance of tissues in the follow-up repair of corrected diets. In fact, some of us are born with poor rubber in our arteries. The conclusion is that American diets contain too much concentrated foods, low in vitamins, residue and alkaline minerals, and high in carbohydrates and acid minerals. Economic betterment, however, gives the city dweller the advantage as to vegetables and fruits over the rural dweller, who, in some localities, avails himself least of such foods.

The usefulness of the white rat has been mentioned before. It resembles man because of its

omnivorous feeding habits. Its developmental cycle is thirty times more rapid than that of man. Data as to diets and growth have been thus made available, and the results of the optimum diet appear to be as follows: uninterrupted growth, normal reproduction, prevention of premature ageing (mothers successfully raising their young), development of strong bones and sound teeth, and the building up of bodily resistance to infections.

The problem for the physician, the parent, and the teacher is to prevent malnutrition among children, thereby materially assisting them to live longer and better. The habits of the middle-aged may be too deep-rooted to change, and economy or "girth-control" is placed on the seasoned adult and not on the child. It must not be forgotten that between-meal ice cream (15 cents) of 500 calories and 7 grams of protein; ten-cent candy bars of 450 calories; chocolate milk-shake (15 cents), 500 calories and 15 grams of protein; when compared with a quart of milk at 12 cents, 700 calories and 33 grams of protein, suffer severely in the comparison.

THE PUBLIC ASPECTS OF HEART DISEASE

There are no logical limits to the service that a health department may perform; a study of any disease may offer some measure of control. Limitation of immigration, the falling birth rate, and the increase of the average age, year by year, are accompanied by increases in certain diseases in some of the older portions of the United States; therefore, each year there must tend to be a larger portion of the population affected by chronic disease in advanced age groups.

Heart Disease in the Adult.—The increasing annual mortality rate from diseases of the cardiovascular system has been demonstrated by many workers. Infectious fevers may cause inflammation of the lining and the covering of the heart. Rheumatic fever, pneumonia, and scarlet fever, as well as the epidemic influenzas, have, as their complication, valvular disturbances and impairments. Though the original disease may have been dissipated, the injury to the heart muscles still remains. The whole arterial system may suffer from a chronic inflammation such as might be brought on by active syphilis. Rheumatic fever is on a par with syphilis as a cause of heart disease. The inflammatory valvular diseases of the heart that may involve the mitral valve are perhaps of rheumatic origin and date back to childhood. Lesions seated in the aortic valve probably arise in adult life, and quite often syphilis is the cause.

Endocarditis may be aggravated by, or may or may not follow, a prophylactic tonsillectomy to the extent of even an active septicemia. Bacterial infection of the endocardium begins as a sequel of the focal infections in the mouth, nose, ears, or accessory sinuses. The futility of treatment in these cases is well known.

Vascular degenerative diseases are not reportable to the health department; yet the hazards, especially the industrial hazards, to the public health are no less important than typhoid carriers, cases of leprosy, etc. This is particularly true in the cardiac cripple's operating a motor car.

The question of tonsillectomy as a preventive measure against rheumatic fever is argued more today than ever before. This operation in the last forty years has been performed with rapidly increasing frequency, but childhood rheumatism is not infrequently seen, despite the fact that the average child today is tonsil minus. In 1930 and 1931, 2550 tonsillectomies were performed at the San Francisco Hospital, 1909 being of school age, and 359 being of preschool age.

It is no news that heart disease exists everywhere, nor does its existence mean an acute public health problem, even though the disease causes one-eighth of all deaths of all ages, and one-fifth of all deaths beyond the age of forty. Patients' costs for hospital admissions have an average range of \$100 for care and \$100 from loss of work. When you consider that the cardiac cripple is a repeater during a year, the financial losses to the community mount to millions of dollars annually. The cardiac center, or the clinic with the coördination and unifying of all activities for combating the disease, is amply justified.

Statistical Data.—The age grouping may be of significance, especially in San Francisco, for reasons to be brought out later. The percentage of age groups is comparatively the same until those of twenty-five to twenty-nine years, when it reaches 12 per cent; those of thirty-five to forty-four bring it to 18 per cent, and those of forty-five to forty-nine to 14 per cent, when it assumes a decidedly downward trend until it reaches one per cent at seventy-five years. In San Francisco 46 per cent of the population is in age groups over 35 per cent.

In 1913 Cleveland had the lowest death rate from heart disease, 118.0 per 100,000. In the same year San Francisco's rate was twice as much, 241; Boston's, 211; Chicago, Detroit, Los Angeles, New York, and St. Louis in 1913 had practically the same mortality rate. It is astonishing to note that each city in this list, except San Francisco, has had marked increases year by year until Boston reached the grand total rate of 319 in 1928, and only two cities were under 200, Cleveland and Detroit. In the sixteen years under consideration, the rate of San Francisco in 1913, 241, had not increased in 1928 and in 1930; but this period was marked with fluctuations, the highest rate appearing in 1926—285. This step-ladder-like increase in many of the cities may be due in part to the fact that the older cardiac age groups are top-heavy. The reason for San Francisco's steady rate is obscure.

The social status may be of interest, since the number of deaths from 1921 to 1930 has been about the same in the unmarried, while the deaths in the married groups are nearly five times greater, and the rate is steadily increasing in the divorced groups. The number of deaths in Chinese, as could be expected, steadily increased from 1906 until 1921, when they have grown less. Perhaps of some interest is the fact that the deaths in the foreign-born double those of our own nativity, and this rate continues to be manifest in various yearly periods. There has been no noticeable

change in the percentage of deaths in hospitals, for in 1906 it was thirty-one, while in 1930 it was forty-two.

Heart disease still continues, as it has through the entire decade, the leading single cause of death, the rate for 1930 being 241.88 per 100,000 population, a higher rate than was found in either of the two preceding years. A total of 1549 deaths from heart disease occurred in 1930: 954, or 61.5 per cent, male; 595, or 38.5 per cent, female. Ninety-four per cent of these deaths occurred in the age group over forty. Some of this high rate may be due to the fact that San Francisco has a high age average in its population. However, definite rates in age groups cannot be established, since the age distribution of our population under the present census will not be known until the publication of the census findings.

A study of the relationship existing between early childhood infections and various types of heart disease in later adult life offers an interesting statistical problem, but one impossible of definite analysis without individual histories, which cannot be gathered from the incomplete data on death certificates.

THE RÔLE OF PREVENTIVE MEDICINE

If it is urged upon health officials that acquisition of more knowledge is badly needed, it is only in order that the beneficent mission and influence of the medical profession may be fulfilled in the field of preventive medicine and in national economics. For example, the high cost of infant mortality.

Statistically, the potential value of a baby at birth is approximately \$10,000 in actual money, not affection. Infant mortality, therefore, has an enormous effect on prospective national wealth. For instance, in 1928, 133,719 babies died, with a financial loss of over \$1,003,000,000.

It can generally be admitted that practically every disease affecting the human being is susceptible to some measure of control. The health officer of the future must assume the responsibility of guiding the attack on these. Control does not mean the application of police power, the making and passing of new ordinances, or presuming that ordinary quarantine is continuously effective. The medical profession should have intelligent and serious regard for such matters, and give them their active coöperation. The medical school must realize that the undergraduate curriculum must admit preventive medicine, perhaps in the fourth year. The health officer is aware that 30 per cent or more of confinements occur without medical attendance, and about three million women die from abortions, miscarriages, premature labor, or accidents at delivery. The health officer is also aware of 700,000 cases of communicable and preventable diseases in children; the problem of malnutrition involving at least four million more; the problem of physical defects, such as vision, adenoids, tonsils and teeth, involving at least twenty million. Surely preventive medicine is the most profitable future field of practice.

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